

## Potential New Blueberry Cultivars for the Gulf Coast Region of the U.S.

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### Abstract

Three elite rabbiteye (*Vaccinium ashei*) and one southern highbush (*V. corymbosum*) blueberry selections are being developed for release to nurserymen for propagation and distribution to growers in the Gulf Coast region of the U.S. Among the new rabbiteye blueberries, wild accessions contribute to the parentage and as a result, new genes are being infused into rabbiteye blueberry cultivars. One elite selection, MS 706, is a productive rabbiteye blueberry selection that will be recommended only for trial plantings in the more extreme coastal regions, and will provide growers with a new early ripening rabbiteye blueberry cultivar that will enhance their potential to exploit the lucrative early berry market. Another, MS 271, will be recommended for trial plantings by growers wishing to expand into the baking segment of the processing industry which demands a smaller sized berry than those typically produced by current rabbiteye blueberry cultivars. Still another rabbiteye blueberry selection, MS 454 possesses the vigor, high production potential, and good fruit quality required for early- to mid-season fresh and processing blueberries. MS 812, a relatively low-chilling southern highbush selection, is vigorous, productive and has the fruit quality and earliness needed for early, fresh berry market production.

### INTRODUCTION

Consumer demand for blueberries is now at record levels in the U.S. and worldwide and as a result, the industry has experienced unprecedented growth. Expanding markets for blueberries provide growers with the potential to capitalize on new opportunities and record prices, and to optimize profits. Although blueberry growers in the Gulf Coast region of the U.S. are typically small farmers (<10 hectares), their combined production continues to grow, and in Alabama, Louisiana, Mississippi and Texas alone, encompasses approximately 2,000 hectares with a crop value exceeding \$20 million annually (Braswell, Extension Professor, Mississippi State Univ., personal communication). Regional blueberry growers enjoy a competitive advantage over more northern growers since they are among the first U.S. producers to provide fruit for the lucrative fresh blueberry market, as well as for processing and juice. However, unprecedented increases in land, labor and production costs, and expanding competition resulting from new blueberry plantings worldwide threaten to diminish the profitability of production. The development and infusion of new blueberry cultivars having greater productivity, quality and adaptation to Gulf Coast region offers the greatest opportunity for sustaining the industry and exploiting competitive market advantages. Historically, the foundation of the U.S. Gulf Coast blueberry industry has been the rabbiteye blueberry, grown on greater than 90% of the acreage due to its vigorous growth habit and high production potential. Rabbiteye blueberries thrive in relatively hot and often dry summers and survive the more highly weathered mineral soils of this region that are often unsuitable for production of other blueberry types. Most current rabbiteye blueberry cultivars originated from a narrow genetic base involving only a few cultivars (i.e., Ethel, Myers, Clara, Black Giant) and their continued usage in breeding has resulted in inbreeding depression (Lyrene, 1983). Thus, breeding strategies being employed in the USDA-ARS program involve the introduction and infusion of new germplasm and cytoplasms from wild native selections into the genetic pool for new rabbiteye blueberry



cultivar development.

Due to their early ripening and fresh fruit quality characteristics, southern highbush blueberry cultivars offer promise for regional growers to expand their opportunities to compete in the more lucrative fresh blueberry market. Development of the southern highbush blueberry cultivars has involved complex hybridizations between the northern highbush blueberry (*V. corymbosum*) and native southern blueberry species (i.e., *V. darrowii*) and subsequent cycles of recurrent selection for low chilling requirement, fruit quality, and tolerance to environmental stresses (Sharp and Darrow, 1960; Sharp and Sherman, 1971). However, few current southern highbush blueberries possess sufficient adaptation specific to the Gulf Coast region for profitable and sustainable production. Thus, these same breeding strategies are being continued in new cycles of recurrent selection for development of southern highbush blueberries having improved adaptation, vigor, productivity, and fruit qualities.

## ORIGINS

A rabbiteye blueberry selection, tested as MS 706, is being developed for release and use for blueberry production for the early fresh market. MS 706 originated from a cross of MS 598 × Florida 80-11 and was selected at Stone County, MS in 1996. MS 706 was subsequently tested in McNeil and Stone County, Mississippi. MS 598 originated from a cross of wild *V. virginicum* Ait. (syn. *V. ashei* Reade) selection number 11 made near Lyman, MS, and the rabbiteye blueberry cultivar Delite. FL 80-11 originated from an open-pollinated cross of the rabbiteye blueberry cultivar Beckyblue (Fig. 1). Thus, MS 706 possesses new rabbiteye blueberry cytoplasm not found in other blueberry cultivars.

MS 271, another rabbiteye blueberry being developed for release, resulted from a cross between US 229, a wild rabbiteye blueberry selected in Stone County Mississippi in 1977 and the rabbiteye blueberry cultivar Aliceblue (Fig. 2). Thus, MS 271 also contains cytoplasm new to rabbiteye blueberry cultivars. It was selected in 1984 and subsequently propagated and tested in Poplarville and McNeil Mississippi.

A third rabbiteye blueberry selection in development for release and also containing new rabbiteye blueberry cytoplasm is MS 454. This strain resulted from a cross between T 23 and T 260 and was selected in Stone County, MS in 1988. T 23 originated from a cross between the wild Georgia rabbiteye blueberry selection W-4, and 'Callaway', while T 260 originated from a cross between 'Brightwell' and T 139 ('Tifblue' × 'Menditoo') (Fig. 3).

Finally, a new southern highbush cultivar, tested as MS 812, is also in development for release as a new cultivar for the early U.S. fresh berry market. MS 812 resulted from a cross between the southern highbush cultivars Bluecrisp and Magnolia (Fig. 4) and was selected at Poplarville, Mississippi in 1999.

## DESCRIPTION AND PERFORMANCE

Plants of the rabbiteye blueberry selection MS 706 are very vigorous, upright in growth, and productive. Berries are medium size with good color and have small dry scars. The flavor of newly-colored berries is mild and less tart than those of most other rabbiteye blueberry cultivars (Table 1). The most outstanding feature of MS 706 is the early fruit ripening which begins 4-5 days ahead of 'Climax', the most widely grown early-ripening rabbiteye blueberry cultivar. It also blooms several days earlier than 'Climax' and about the same time as the southern highbush cultivars Star and O'Neal. Therefore, sites for planting MS 706 should be carefully selected to prevent losses from frost injury, and trial plantings will be recommended for areas within or above USDA plant hardiness zone 8b. MS 706 will provide an addition to the collection of other recently released early-ripening rabbiteye blueberries such as 'Alapaha' (NeSmith, 2002) and provide beneficial cross-pollination to other early-blooming rabbiteye blueberries.

Plants of MS 271 are vigorous with upright growth and are also very productive. Berries of MS 271 are relatively small with greater suitability for use in baking than most currently grown rabbiteye blueberry cultivars. They also have good color, small scars and

very good flavor (Table 1). Outstanding features of MS 271 include a very high production potential and berry size more consistent with the needs of the specialty baking market. The exact chilling requirement of MS 271 is not known, but blooming and ripening occur about the same time as 'Tifblue'. MS 271 should be tried where rabbiteye blueberries are successfully grown for the processing market, and will be beneficial in cross-pollinating other rabbiteye blueberry cultivars.

Plants of MS 454 are vigorous, upright, and very productive. Berries of MS 454 are medium to large and have very good color, firmness, picking scars, and flavor (Table 1). Outstanding features of MS 454 include its high productivity and larger berries than currently grown cultivars such as 'Powderblue'. Although the exact chilling requirement of MS 454 is not known, blooming and ripening periods of MS 454 begin several days ahead of those of 'Powderblue'. MS 454 will also require cross-pollination and be beneficial to other mid-season rabbiteye blueberry cultivars in successfully achieving pollination and fruit set.

Plants of MS 812 are as vigorous and productive as other southern highbush blueberry cultivars, and fruit have good color, firmness, small scars, and flavor (Table 1). The outstanding feature of MS 812 is its potential for production of early high quality fruit for the fresh market. Although the exact chilling requirement is not known, it has been successfully grown in south Mississippi where average chilling hour accumulation may be as low as 500 h or less. With MS 812, adjacent plantings of relatively early blooming southern highbush cultivars (i.e., Star and Santa Fe) are required to achieve good pollination and fruit set. Also, as is the case with many other relatively low-chill blueberries being grown in the region, frost protection may be required to protect blooms and small fruit from late spring frost injury.

### Literature Cited

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### Tables

Table 1. Berry quality and vigor ratings for elite rabbiteye selections and selected cultivars averaged over three years (2005–2007) at Stone County in southern Mississippi<sup>2</sup>.

Cultivar	Crop	Size	Color	Firmness	Scar	Flavor	Vigor
MS 706	8	7	7	8	8	7	8
MS 271	8	6	6	8	9	8	8
MS 454	8	8	8	8	8	8	8
MS 812	7	8	8	8	8	8	8
Star	7	7	8	8	8	8	8
Climax	8	7	8	8	8	7	8

<sup>2</sup>Characters rated on a 1 to 9 scale, with 9 being the most desirable commercially.

Figures

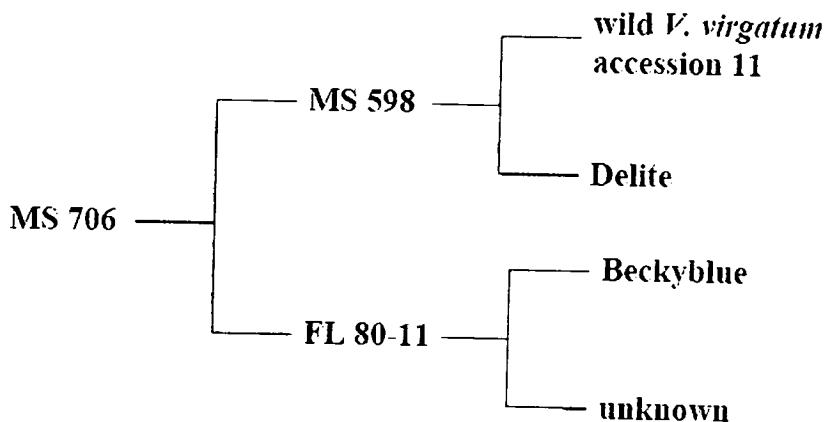


Fig. 1. Pedigree of MS 706 rabbiteye blueberry.

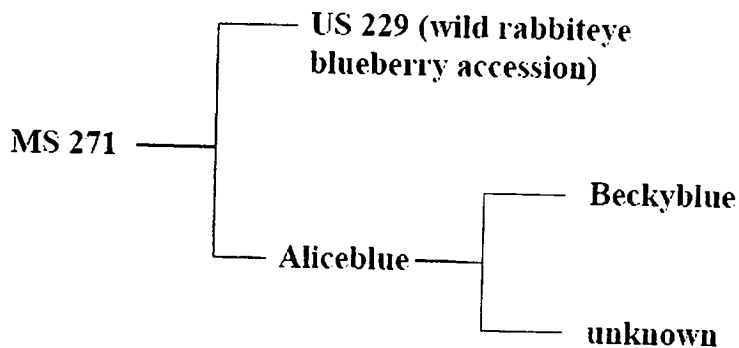


Fig. 2. Pedigree of MS 271 rabbiteye blueberry.

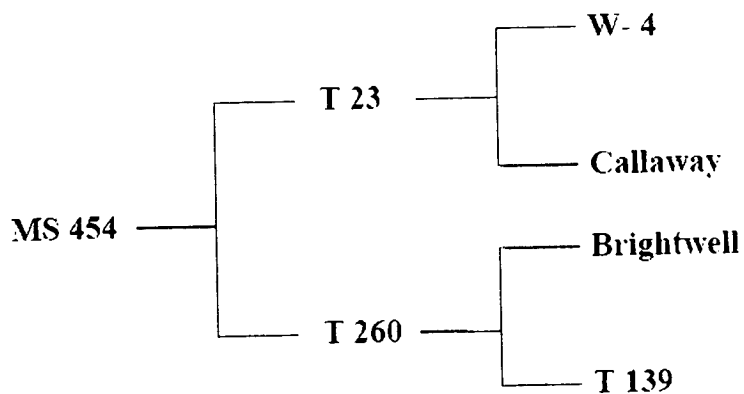


Fig. 3. Pedigree of MS 454 rabbiteye blueberry.

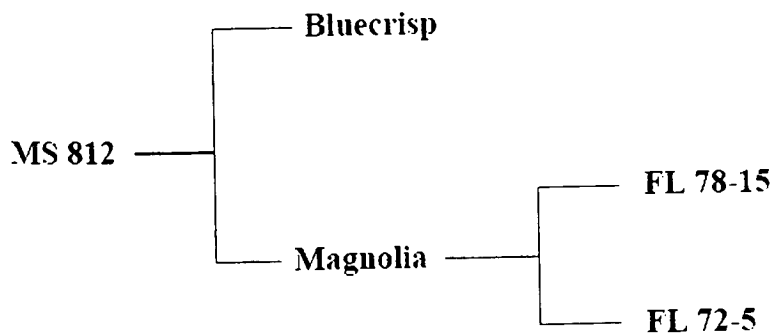


Fig. 4. Pedigree of MS 812 rabbiteye blueberry.